

Special Seminar

October 1, 2002

1:00 p.m. – 2:30 p.m.

**Conference Room 720, 7th Floor
1001 I Street, Sacramento**

**Video Conference
9500 Telstar Avenue
Annex II, Room 106
El Monte**

Ultrafine Particles - Physical, Chemical, and Toxicological Characteristics - State of the Art

**Constantinos Sioutas, Sc.D.
Deputy Director, Southern California Particle Center and Supersite
Department of Civil and Environmental Engineering
University of Southern California
Los Angeles, California**

Atmospheric ultrafine particles (UFP, dia. <150 nm) have recently received significant attention because recent toxicological investigations have indicated their potential for eliciting adverse health effects. Due to their small size, abundance and large surface area per unit mass, UFP are endowed with unique characteristics such as increased adsorption of organic molecules and enhanced ability to penetrate cellular targets in the lung and systemic circulation (Frampton 2001; Health Effects Institute 2002; Nemmar, et al. 2002; Oberdorster 1996; Utell and Frampton 2000).

This seminar will present recent advances in the field of ultrafine particulate matter (PM) that resulted from studies sponsored by the Southern California Particle Center and Supersite (funded by ten U.S. EPA) and the California Air Resources Board.

The following topics will be discussed:

- Why are we interested in ultrafine PM
- What do we know about their toxicological properties
- What do we know about their sources, formation mechanisms
- What do we know about their diurnal, seasonal, and spatial characteristics
- Technologies developed by the Aerosol Laboratory at USC by funds through the SCPCS to measure physical, chemical, and toxicological properties of ultrafine PM
- Technologies for reducing their emissions

Dr. Sioutas is a Professor of Civil and Environmental Engineering at the University of Southern California. He was born in Athens, Greece. After receiving his undergraduate degree in mechanical engineering from the University of Thessaloniki, Greece, he came to the United

States (U.S.) as a Fulbright Foundation fellow in order to continue his graduate studies. He received a Master of Science degree in Mechanical Engineering and a Master of Science degree in Aerospace Engineering, both from the University of Minnesota. Subsequently, Dr. Sioutas worked as an Advanced Product Development Engineer for 3M for two years, prior to continuing his doctoral studies at Harvard School of Public Health in the department of Environmental Engineering, where he received his Doctor of Science degree in 1994.

Dr. Sioutas started his academic career in September 1995 as an Assistant Professor of aerosol science at the Harvard School of Public Health in the department of Environmental Engineering, prior to joining the faculty of the University of Southern California (USC) in January 1998.

Dr. Sioutas' research is focusing on developing technologies for measuring the physic-chemical characteristics of air pollutants and determining their toxic properties. In addition, Dr. Sioutas and his group are developing novel technologies for reducing the emissions of air pollutants. Since 1993, Dr. Sioutas has authored over 80 peer-reviewed publications and holds nine U.S. patents in the development of aerosol instrumentation. He is a Fulbright Fellow (1986), a recipient of the 3M Circle of Technical Excellence Award (1991), and a recipient of the USC School of Engineering Outstanding Research Faculty Award (2000). He is also a member of the Air Quality Advisory Committee on Particulate Matter of the State of California.

Dr. Sioutas has been the principal investigator in the design of a variety of air pollutant monitors, including the Harvard/EPA Particle Concentrator, continuous PM_{2.5} particulate monitor (CMM), Ultrafine and Coarse Particle Concentrators and a High-Volume PM Size-Classifer for collecting coarse, fine, and ultrafine PM for toxicological studies. These technologies are being currently used by agencies such as the US. EPA, the National Institute of Public Health and the Environment of the Netherlands, and the Canadian Government.